

MONTHLY WEATHER REVIEW.

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INTRODUCTION.

The REVIEW for November, 1894, is based on reports from 3,223 stations occupied by regular and voluntary observers. These reports are classified as follows: 149 reports from Weather Bureau stations; 36 reports from U. S. Army post surgeons; 2,241 monthly reports from State Weather Service and voluntary observers; 32 reports from Canadian stations; 219 reports through the Southern Pacific Railway Company; 502 marine reports through the cooperation of the Hydrographic Office, Navy Department, and "New York Herald Weather Service;" monthly reports from 37 U. S.

Life-Saving stations; 39 reports from navigators on the Great Lakes; monthly reports from local services established in all States and Territories; and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

The WEATHER REVIEW for this month has been prepared under the general editorial supervision of Prof. Cleveland Abbe. Unless otherwise specifically noted, the text is written by the Editor, but the statistical tables are furnished by the Division of Records and Meteorological Data, in charge of Mr. A. J. Henry, acting chief of that division.

CHARACTERISTICS OF THE WEATHER FOR NOVEMBER, 1894.

The most prominent features of the month of November were the sudden development of the storm of the 5th on the coast of New Jersey; the severe storms of the 2d, 9th, 10th, 11th, and 26th in the Lake region; the general deficiency of precipitation in the middle and southern portions of the United States; and the excess of temperature from the Pacific coast eastward to the one hundredth meridian. The prevailing

characteristic of the month was the persistent motion of high areas and the formation of ridges of high pressure from Oregon southeastward to the Gulf and south Atlantic States with a small depression on the southwest side of this ridge and numerous depressions on its northeast side, from which there resulted an average distribution of pressure as shown on Chart II, characterized by a distinct ridge of high pressure from Oregon, Nevada, and Idaho southeast to Georgia.

ATMOSPHERIC PRESSURE.

[In inches and hundredths.]

The distribution of mean atmospheric pressure reduced to sea level, as shown by mercurial barometers not reduced to standard gravity and as determined from observations taken daily at 8 a. m. and 8 p. m. (seventy-fifth meridian time), during November, 1894, is shown by isobars on Chart II. That portion of the reduction to standard gravity that depends on latitude is shown by the numbers printed on the right-hand border. This Chart also gives the so-called resultant wind directions for this month, based on the data given in Table IX of this REVIEW.

During the current month of November the highest mean pressures have been: 30.29, Salt Lake City; 30.26, Idaho Falls, Winnemucca, and Carson City; 30.25, Atlanta, Montgomery, and Mobile; 30.24, Charleston, Meridian, and El Paso. Lowest mean pressures: 29.89, Sydney, N. S.; 29.91, Father Point, Que.; 29.93, St. Johns, N. F.; 29.95, Halifax, N. S., and Eastport.

The normal distribution of atmospheric pressure and normal resultant wind direction for the month of November were approximately shown on Chart V of the REVIEW for November, 1893, as computed by Prof. H. A. Hazen, and are not now reproduced. As compared with the normal for

November, the mean pressure for the current month was deficient in Nova Scotia, Quebec, Maine, northern New York, and nearly the whole of Canada, and in excess over the whole of the rest of the country. The maximum excesses were: 0.12, Tatoosh Island and Port Angeles; 0.11, Mobile; 0.10, New Orleans, Galveston, and Jacksonville.

As compared with the preceding month of October, the pressures, reduced to sea level, show a maximum rise of 0.25 at Huron, Moorhead, and Sioux City, 0.24 at St. Paul, Omaha, and Concordia, and a maximum fall of 0.09 at Sydney, N. S., 0.06 at Charlottetown, P. E. I., and 0.05 at Chatham, N. B.

DIURNAL VARIATIONS.

The systematic periodic diurnal variations of pressure are shown by the hourly means given in Table VI.

AREAS OF HIGH AND LOW PRESSURE.

The following sections give some details as to the phenomena attending the individual areas of high and low pressure. Hitherto it has been customary to enumerate the storm wind signals in connection with special areas of low pressure. During the summer months high winds occur in connection with areas of low pressure, or so-called storm centers, but during

the winter season the northwesterly gales are by reason of their coldness associated with the areas of high pressure. In general, it is proper to consider a strong wind in connection with steep barometric gradients and to postpone any decision as to whether the low pressure on one side, or the high pressure on the other is especially responsible for the gradient or the wind. As the ordering of wind signals oftentimes depends quite as much on the approach of a high area as of a low the Editor will, for the present, publish these signal orders in connection with the chapter on "High winds," where the connection between the high and low areas will also be mentioned when necessary.

MOVEMENTS OF CENTERS.

The following table shows the date and location of the center at the beginning and ending of each area of high or low pressure that has appeared on the U. S. Weather Maps during the month, together with the average daily and hourly velocities. The monthly averages will differ according as we consider each path as a distinct unit, or give equal weight to each day of observation; in the first case the monthly average is taken by paths, in the latter case by days.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long. W.	Length.	Duration.	Daily.	Hourly.
High areas.										
I.	1, a. m.	34	82	3, a. m.	43	60	1,500	3.0	500	20.8
II.	1, a. m.	41	117	3, a. m.	30	102	1,200	3.0	400	16.7
III.	2, p. m.	45	123	7, a. m.	32	80	3,600	4.5	800	33.3
IV.	5, p. m.	43	112	9, a. m.	31	98	2,200	3.5	629	26.2
V.	7, a. m.	54	115	10, a. m.	50	60	2,800	3.0	933	38.9
VI.	8, p. m.	53	111	13, a. m.	36	71	3,250	4.5	722	30.1
VII.	10, p. m.	45	114	15, p. m.	33	78	5,100	5.0	1,020	41.7
VIII.	15, a. m.	54	117	18, p. m.	47	60	4,400	3.5	1,257	52.4
IX.	17, a. m.	55	110	20, p. m.	42	70	3,200	3.5	914	38.1
IX a.	20, p. m.	42	70	21, p. m.	46	57	800	1.0	800	33.3
IX b.	20, p. m.	42	70	22, a. m.	36	70	1,200	1.5	800	33.3
X.	17, p. m.	44	125	19, a. m.	38	107	1,100	1.5	933	40.5
XI.	19, p. m.	46	125	25, a. m.	33	96	3,000	5.5	544	22.7
XII.	20, a. m.	50	110	22, a. m.	30	76	2,100	2.0	1,050	43.8
XIII.	24, p. m.	53	97	27, p. m.	30	80	2,300	3.0	767	31.5
XIV.	26, a. m.	55	115	30, p. m.	46	64	2,700	4.5	600	25.0
XV.	27, p. m.	34	121	29, a. m.	40	116	800	1.5	533	22.2
Sums.							41,250	54.0	1,202	
Mean of 17 paths.									718	29.9
Mean of 54 days.									764	31.8
Low areas.										
I.	1, a. m.	49	68	1, p. m.	51	64	150	0.5		
II.	1, a. m.	35	100	4, a. m.	51	60	2,350	3.0	763	31.8
II a.	1, p. m.	33	97	3, a. m.	46	78	1,350	1.5	900	37.8
III.										
IV.	2, a. m.	53	117	4, a. m.	44	86	1,600	2.0	800	33.3
V.	4, p. m.	55	123	6, p. m.	51	100	1,100	2.0	550	22.9
VI.	5, a. m.	39	75	7, a. m.	50	56	1,300	2.0	650	27.0
VII.	6, p. m.	41	97	8, p. m.	39	70	1,500	2.0	750	31.3
VIII.	7, p. m.	55	112	11, p. m.	56	63	2,800	4.0	700	29.8
IX.	10, a. m.	55	119	15, a. m.	48	53	2,900	5.0	580	24.2
X.	13, p. m.	55	115	17, a. m.	54	55	2,750	3.5	786	32.8
X a.	14, a. m.	44	105	16, p. m.	37	83	2,100	2.5	840	30.8
XI.	16, p. m.	52	114	20, a. m.	48	55	3,050	3.5	871	36.3
XII.	19, a. m.	52	116	21, p. m.	51	69	2,400	2.5	960	40.0
XIII.	20, p. m.	53	112	26, a. m.	46	55	3,000	5.5	550	22.9
XIII a.	21, p. m.	39	104	24, a. m.	53	55	2,600	2.5	104	4.3
XIV.	23, p. m.	51	130	28, a. m.	50	59	3,600	4.5	800	33.2
XV.	26, a. m.	43	125	29, a. m.	52	98	1,650	3.0	550	22.9
Sums.							36,200	49.5	11,154	
Mean of 17 paths.									657	27.4
Mean of 49.5 days.									731	30.5

HIGH AREAS.

I.—This area was a continuation of No. XI of October, and was central on the 1st, a. m., in the south Atlantic States, after which it moved eastward and continued for several days as a portion of the general high pressure over the Atlantic Ocean.

II.—This was central on the 1st, a. m., in Nevada, after which it extended southeastward as an indefinite area, or ridge, over the Gulf States.

III.—This was central on the 2d, p. m., on the coast of Oregon, and after moving northeast into Alberta stretched rapidly southeast and disappeared on the 7th, a. m., off the south Atlantic coast. Severe frosts preceded the center of high pressure as it moved eastward on the 6th over the Gulf and south Atlantic States.

IV and V.—No. IV was central on the 5th, p. m., in southern Idaho, as a subsidiary portion of the preceding area from which it was separated by a slight depression. Pressure remained high over the Rocky Mountain plateau for two days, and an additional ridge of high pressure, No. V, descended southeastward from the British Possessions. Nos. IV and V united on the 7th, after which the high pressure continued moving southward. But this combined area also seems to have sent a portion more directly eastward, which was central on the 8th, p. m., north of Lake Superior, and disappeared on the 10th, a. m., over Newfoundland; to this portion the No. V is applied. Areas Nos. IV and V can therefore be considered as two independent waves crossing each other on the 7th, p. m., and subsequently pursuing different paths as they had done before.

VI.—On the 8th, a. m., while low No. VIII was central in Alberta pressure rose rapidly in British Columbia and high area No. VI developed rapidly in that region. At 8 p. m. it was central in Alberta, stretching southward as a ridge to high No. IV in Texas. After moving slowly southeast to Manitoba it moved rapidly south on the 10th and by the 12th, a. m., was central in Alabama. It disappeared on the 13th off the middle Atlantic coast.

VII.—This area developed over the Rocky Mountain plateau region on the 10th and was apparently a western prolongation of high No. VI. Pressure continued high until the 13th, p. m., from British Columbia southeastward to Texas, and the location of the centre of No. VII went through numerous oscillations between Utah and British Columbia, until finally, on the 14th, a. m., it was central in Texas, at which time the ridge of highest pressure was very narrow and stretched from Texas northwest to Oregon and also eastward to Georgia. It was at this time undoubtedly prolonged in these two directions far beyond the limits of our maps, forming the boundary of one of those great areas of low pressure within which several special low centres and cyclonic whirls occur.

It is proper here to call renewed attention to the mechanism of high and low areas. Two convenient words were suggested in 1870 by Prestel, viz, "pleiobar" and "meiobar." Isobars for high pressure, viz, those above 30 inches, are called pleiobars, and isobars for low pressures, or below 30 inches, are called meiobars. Regions of high or low pressure are therefore respectively pleiobaric and meiobaric areas, but for brevity we will also call them simply pleiobars and meiobars. We will furthermore not apply these words to small areas of high and low pressures, but only to the very largest areas, within which it often happens that there are several smaller highs and lows. Thus, on the 13th, a. m., a meiobar or general area of low pressure extended from northern Europe westward over the North Atlantic and Labrador into our Lake region, within which three or more regions of low pressure can be distinguished; at the same time a region of high pressure, or pleiobar, prevailed from Persia westward over Asia Minor and northern Africa, the mid-Atlantic Ocean, our Atlantic and Gulf States, and Rocky mountain plateau region, within which belt four centres of high pressure can be distinguished.

It is the underflow of air from the greater pleiobars into the extensive meiobars that is the prominent feature of what is called the general movement or general circulation of the atmosphere, and this flow is controlled by the rapid diurnal rotation of our globe. The individual smaller areas of high and low pressure that accompany these larger move-

ments are initiated by the character of the earth's surface as to topography, temperature, and moisture. That is to say, the pleiobar is irregularly fed and built up in patches of "high;" the meiobar is irregularly broken up and subdivided into areas of "low." From a chartographic and descriptive point of view, the areas of high and low pressure, whose paths are described monthly in this REVIEW, represent the breaking up of the greater pleiobars and meiobars into fragments, a process that is continually going on. The reconstruction of these greater areas of high and low pressure is also continually going on, but in the upper region of the atmosphere where we have as yet but few observations and unsatisfactory theories to guide our thoughts. From a dynamic point of view the smaller highs and lows represent a new distribution of energy, a dissipation of the energy that was originally massed in the general circulation of the atmosphere, or potentially concealed in the pleiobars and meiobars. The sum total of all this energy, kinetic, potential, and thermal, is of course equal to that received from the sun.

VIII.—On the 15th, a. m., pressure rose rapidly in British Columbia, Alberta, Washington, and Oregon, as an extensive area of high pressure pressed eastward on the Pacific coast toward the great meiobar, whose western end was marked by low pressure No. X, then central in Manitoba. On the morning of the 15th frost occurred in western Oregon and generally in Washington. On the morning of the 16th a still more severe frost occurred throughout the Pacific States and plateau region, at which time highest pressure was central in Wyoming, but without having diminished in Oregon and Washington. This southeast movement is in intimate connection with the development of low pressure in southern California; on the 15th, p. m., pressure at Yuma reached its lowest point for the month. In general, the presence of high pressure on the plateau region and low pressure in southern California produces northeast winds, clear weather, low temperatures, and very dry air in the eastern half of California. These cold, dry, northeast winds are considered injurious to vegetation, as they produce a greater evaporation from the plants than the roots are able to supply. By the 17th, a. m., this area was central in western Texas, after which the ridge of high pressure extended from Texas northeast to Nova Scotia, and northwest to Oregon, approximately repeating the conditions prevailing on the 13th, a. m. After the 17th, a. m., and apparently by virtue of some additional movement of the air southward over Labrador, the northeastern arm of this ridge merged into the area of high pressure that was central over Newfoundland on the 18th, p. m.

IX.—On the 17th, a. m., pressure began to rise in Alberta on the north side of low No. XI. This high area moved rapidly southeastward, reaching Iowa on the 19th, a. m., and thence eastward, becoming central on the 20th, a. m., in New Jersey, and 20th, p. m., at Cape Cod. By the 21st, a. m., this area seems to have extended from Cape Breton to North Carolina, while pressure over the adjoining part of the Atlantic Ocean was quite high; by the 22d, a. m., while a portion of this area (IXa) had disappeared over the Atlantic, another portion (IXb) must be considered as having merged with high area No. XII.

X.—On the 17th, p. m., pressure began rising in Oregon and Utah, and during the 18th a ridge prevailed trending southeast over the plateau region. By the 19th, a. m., this had disappeared as a well-marked high area in the presence of the following area and ridge that had formed a little way farther north.

XI.—On the 19th, a. m., pressure rose rapidly in Oregon and Washington in the rear of low No. XII, and remained high in this region until the 22d, a. m., by which time the central highest pressure was in Idaho, and by the 23d, a. m., in Oklahoma, after which it remained nearly stationary until it disappeared on the 25th, a. m., in western Texas.

XII.—On the 20th, a. m., pressure rose in Assiniboia between lows Nos. XII and XIII. This moved rapidly southeastward, and by the 21st, p. m., had reached South Carolina and joined the southern portion of high No. IX, after which it disappeared off the Atlantic coast.

XIII.—On the 24th, p. m., pressure rose in Manitoba in the rear of low No. XIII, and prevailed as a part of a pleiobar covering the region between the Gulf of Mexico and Hudson Bay, within which several minor elevations appeared. The principal center of high pressure moved eastward, reaching the Ottawa River on the 25th, p. m. It then shifted suddenly southward into Virginia, and disappeared on the 27th, p. m., off the coast of Florida.

XIV.—On the 26th, a. m., pressure began to rise in Alberta, and apparently also in British Columbia. By the 26th, p. m., the highest pressure was central in western Assiniboia, while low No. XV was off the coast of Washington and Oregon. The center of this high area moved eastward over Manitoba, and southeastward through Ottawa, disappearing on the 30th in Nova Scotia, but its cold, northerly winds were felt as far south as Florida and the Gulf of Mexico. From the 26th to the 30th, the pressure at Key West rose 0.06 inch, and the temperature remained entirely unchanged with northeast winds and clear weather, except a light rain on the 30th; from this point to the St. Lawrence Valley the country was under the influence of high area No. XIV, and the more so with increasing latitude.

XV.—On the 27th, in the rear of low No. XV, pressure rose in California with southerly winds, the temperature remained stationary, and frosts prevailed on the morning of the 28th. High area No. XV moved northward into Idaho, where it disappeared on the 29th, which was, of course, merely a surging, as it were, of the high pressure or pleiobar located on the Pacific Ocean to the southwest of California.

LOW AREAS.

I.—This was a continuation of low No. XVIII of the series for October. It was central on the 1st, a. m., north of the St. Lawrence, and disappeared on the 2d, a. m., north of Newfoundland.

II.—This was central on the 1st, a. m., in northern Texas, but by the 1st, p. m., two centers had developed within an oval region, and these continued moving side by side until they again joined on the 3d, a. m., in the valley of the Ottawa River and disappeared finally on the 4th, a. m., in Labrador. High winds and gales in the Lake region and on the New England coast on the 3d accompanied this area.

III.—This number is given to the low pressure extending up the Gulf of California. The principal minima of the month at Yuma occurred on the 3d, p. m., 29.96; 7th, p. m., 29.91; 15th, p. m., 29.78; 21st, p. m., 29.84; 28th, p. m., 29.96. As has been remarked in previous MONTHLY REVIEWS, the trough of low pressure, which extends from Yuma southward and which on the preceding dates had a special extension northward, has some general connection with the appearance of low pressures in British Columbia and Alberta. Occasionally a trough extends northward over Arizona into British America, while at other times the trough evidently extends rather rapidly from British America southward to Arizona and the Gulf of California. The principal depression of the present month occurred on the 15th, p. m., at which time low area No. X was central near the southern end of James Bay and low No. Xa was central in Indian Territory. These two low areas, together with No. III in Arizona, at that time constituted a portion of the great meiobaric area reaching from the Baltic Sea west-southwest over the Atlantic, Labrador, the United States, and undoubtedly still farther southwest into the Pacific Ocean. Such meiobars, and therefore to a certain extent, the special low which we call No. III, and which frequently appears on

our maps as extending from Arizona southward, represent broad features of the general atmospheric circulation. Their origin must not be sought in what are called local conditions, but in the general conditions, such as those which form the great areas of high pressure on the Atlantic and Pacific oceans; that is to say, the same causes that operate to produce the Atlantic and Pacific pleiobars also produce the meio-bars that lie between them.

IV.—On the 1st, p. m., pressure fell in British Columbia, and a low area was undoubtedly central in the northern portion of that region; by the 2d, a. m., this center may be located in Alberta; it moved southeastward and disappeared on the 4th, a. m., in the Lake region by combination with low No. II.

V.—This appeared on the 4th, p. m., in British Columbia, and on the 5th, a. m., was central near Edmonton; it moved slowly eastward and disappeared on the 6th, p. m., in Manitoba.

VI.—This appeared on the 5th, a. m., off the coast of New Jersey, where it seems to have originated; it rapidly developed into a very severe storm, which was central on the 5th, p. m., at the eastern end of Long Island. The sudden development of this storm seems to have been brought about by the flow southward of an upper current of cold air, causing rain over the Middle States but snow over New York and New England. The storm moved northeast over the Gulf of Newfoundland on the 6th.

VII.—On the 6th, p. m., pressure was lowest in Manitoba, where area No. V seems to have closed up, but at the same time a slight depression, No. VII, originated in eastern Nebraska, which was at first merely marked by a cyclonic system of winds; these were, however, high, cold, southerly winds on the eastern side from Omaha to St. Vincent, and relatively warm northerly winds from North Platte northward to Bismarck. These conditions evidently show that there was on the west a system of descending and warming winds, but on the east a system of ascending and cooling winds. From this combination, low No. VII developed and moved eastward until, on the 8th, p. m., it was central off the middle Atlantic coast, after which it disappeared.

VIII.—On the 7th, p. m., pressure was falling in Alberta, and on the 8th, a. m., low No. VIII was central in Saskatchewan. The central pressure fell decidedly, while this low area moved southeastward into the Lake region, where it was central on the 9th, p. m., as a severe storm of wind and snow; it then moved northeastward, and disappeared on the 11th, p. m., in Labrador. It apparently crossed the Atlantic, reaching the North Sea by the 14th.

IX.—On the 10th, a. m., low pressure was central north of Alberta. It moved slowly southeastward, reaching Lake Superior on the 12th, p. m., and thence eastward, leaving the coast of Newfoundland on the 15th, a. m.

X and Xa.—On the 13th, p. m., an area of low pressure very suddenly appeared in Alberta, and the descending southerly winds from high area No. VII, which then covered the plateau region, brought high temperatures and föhn winds to western Montana. The chinook began at Havre on the 13th at 11 p. m., when temperature rose from 25° to 55° in an hour, and continued between 55° and 62° until 6.30 p. m. of the 14th, when it was suddenly followed by cold, northerly winds. At Helena the chinook lasted from 9 a. m. of the 14th to 3 a. m. of the 15th, when it also was followed by cold, northerly winds. The area covered by the chinook winds at any time is sharply bounded on the northwest side by cold, northerly winds, and as these fill up the lowlands and prevent the descent of the southerly winds the latter are forced to flow more nearly horizontally overhead and lose their chinook character. In general, so far as concerns orography, the south and west winds that blow from the Rocky Mountain region into the area of

low pressure in the midst of the valley and Lake region have a certain amount of descending motion until they are forced up by the underflow of the colder northwest winds. The map of the 15th, p. m., shows that, between the high pressure on the south Atlantic coast and that of British Columbia, there was a broad belt of low pressure extending from the Appalachians to Alberta and from the Rocky Mountains northeast to Labrador. Southwest winds of from 30 to 50 miles prevailed over the Lake region and northwest winds on the eastern Rocky Mountain slope. A trough of low pressure was thus formed, extending from Texas to Labrador, and while area No. X moved eastward into the latter region, a subsidiary area, No. Xa, began to develop on the 14th, a. m., between northerly and southerly winds in Dakota and Wyoming. This area, by a frequent renewal rather than by continuous existence, may be traced through the 14th and 15th until it disappeared on the 16th, p. m., in Kentucky.

XI.—On the 16th, p. m., a low area was central in Alberta, which moved southeastward until, on the 17th, a. m., it was central in North and South Dakota; it then moved eastward, followed by snow over the Lake region, and disappeared on the 20th, a. m., over Newfoundland. High northwest winds prevailed in its rear over New England.

XII.—On the 19th, a. m., low No. XII was central in Alberta, while high No. XI was approaching Oregon from the west. As the low center moved southeast, reaching Athabasca by the 19th, p. m., and the high area advanced eastward into Oregon, the general flow of descending air brought chinook winds to western Montana, southern Idaho, Wyoming, and Colorado. On the 19th, a. m., at Helena, southeast winds, temperature 36, prevailed, while at Havre, 100 miles distant, light northeast winds, temperature 10, prevailed; this northeast wind continued until 4 p. m., when the temperature was 26, but the clouds were moving rapidly from the west; at 4.20 the chinook began at Havre, and at 4.40 the temperature was 50 and the wind west, 36 miles per hour; at 8 p. m., Havre, southwest winds, 32 miles, temperature 44, prevailed, while at Helena, west wind, 30 miles per hour, and temperature 44, prevailed. The lowest pressure moved southeastward, reaching Lake Superior on the 20th, p. m., after which it turned northeast and disappeared at the mouth of the St. Lawrence on the 21st, p. m.

XIII.—On the 20th, p. m., pressure was again low in Alberta; this developed as a slight depression, stretching southward into Indian Territory. Pressure remained low in Assiniboia until the 23d, a. m., after which this area moved southeastward over New England, reaching the east Atlantic coast on the 25th, a. m., where it developed into a severe storm and turned northeastward, passing Newfoundland on the 26th.

XIIIa.—This was the southern offshoot of the preceding area, and was located in Colorado on the 21st, p. m. It may be considered as having moved northeastward, reaching the Lake region on the 23d, and disappearing beyond Labrador on the 24th, a. m.

XIV.—On the 23d, p. m., an area of low pressure was apparently west of British Columbia, and after moving southwestward, finally covered that State on the 25th, a. m., and was central in Saskatchewan on the 25th, p. m. This moved southeast, reaching the St. Lawrence Valley on the 27th, producing high southwest and northwest winds and gales on the 26th and 27th in the Lake region, and on the 28th in New England. It disappeared on the 28th, p. m., in Newfoundland.

XV.—On the 26th, a. m., low pressure was evidently central west of Oregon, and after moving slowly northwestward was, on the 28th, a. m., central near Vancouver Island; it rapidly crossed the Rocky Mountain Divide, and on the 29th, a. m., was central in Manitoba, after which it probably broke up and disappeared, as no further traces of its existence appear at our northern stations.